

LSI DOCKET NO. 01-304

### **ABSTRACT OF THE DISCLOSURE**

#### **LOW VOLTAGE BREAKDOWN ELEMENT FOR ESD TRIGGER DEVICE**

5           As technology in the semiconductor industry advances, semiconductor devices decrease  
in size to become faster and less expensive per function. Smaller semiconductor devices,  
particularly MOSFETs, are increasingly sensitive to Electrostatic Discharge (ESD). ESD can  
either destroy or permanently damage a semiconductor device. Embodiments of the present  
invention assist in preventing ESD damage to semiconductor devices. An embodiment of the  
10   present invention utilizes a diode connected to the substrate terminal of a MOSFET. Under  
normal operation up to the maximum operating voltage, the diode and MOS devices are open and  
do not conduct. The diode triggers when an ESD pulse causes the reverse breakdown voltage of  
the diode to be exceeded. The resultant current switches a connected MOS device, operating in  
bipolar mode, to dissipate the damaging ESD pulse. The ESD pulse is shunted to ground,  
15   thereby avoiding damage to the rest of the device.